

## AMENDMENT

### In the Claims:

Please cancel claims 1-25, 43 and 45. Please amend claims 26-27, 29-30, 41-42, 45 and 50 as indicated below:

1 – 25 (canceled)

26. (currently amended): A method of breeding beef cattle to increase the probability of obtaining a progeny head of beef cattle comprising a predisposition for increased ~~or decreased~~ carcass or weaning weight, comprising the steps of:

- (a) selecting a first parent head of beef cattle comprising a genetic polymorphism genetically linked to promoter P1 of exon 1A of the bovine growth hormone receptor gene, wherein said genetic polymorphism is associated with increased ~~or decreased~~ carcass or weaning weight; and
- (b) breeding said first parent head of beef cattle with a second parent head of beef cattle to obtain at least a first progeny head of beef cattle comprising said polymorphism associated with a genetic predisposition for increased carcass weight or weaning weight.

27. (currently amended): The method of claim 26, further comprising selecting said second parent head of beef cattle based on [[a]] said genetic polymorphism, and/or a second genetic polymorphism, genetically linked to promoter P1 of exon 1A of the bovine growth hormone receptor gene, wherein said genetic polymorphism, and/or said second genetic polymorphism is associated with increased or decreased carcass or weaning weight.

28. (original): The method of claim 26, wherein said genetic polymorphism is further defined as genetically linked to exon 1A of the growth hormone receptor gene.

29. (currently amended): The method of claim 26, wherein said genetic polymorphism is further defined as a polymorphism in a portion of the genome of said head of beef cattle corresponding to the nucleic acid sequence of SEQ ID NO:3.

30. (currently amended): The method of claim 26, wherein said genetic polymorphism comprises a simple sequence length polymorphism.

31. (original): The method of claim 30, wherein said simple sequence length polymorphism comprises a thymine-guanine dinucleotide repeat.

32. (original): The method of claim 31, wherein said thymine-guanine dinucleotide repeat is further defined as flanked by the nucleic acid sequences of SEQ ID NO. 1 and SEQ ID NO. 2.

33. (original): The method of claim 32, wherein said selecting comprises selecting a head of beef cattle comprising at least 12 copies of said thymine-guanine dinucleotide repeat.
34. (original): The method of claim 32, wherein said selecting comprises selecting a head of beef cattle comprising between about 16 and about 20 copies of said thymine-guanine dinucleotide repeat.
35. (original): The method of claim 32, wherein said selecting comprises selecting a head of beef cattle comprising less than 12 copies of said thymine-guanine dinucleotide repeat.
36. (original): The method of claim 30, wherein said selecting comprises PCR.
37. (original): The method of claim 30, wherein said selecting comprises gel electrophoresis.
38. (original): The method of claim 37, wherein said selecting comprises identifying specific amplification products by size.
39. (original): The method of claim 26, wherein one or both of said first parent head of beef cattle and said second parent head of beef cattle is further defined as a *Bos indicus* head of beef cattle.
40. (original): The method of claim 26, wherein one or both of said first parent head of beef cattle and said second parent head of beef cattle is further defined as a *Bos taurus* head of beef cattle.
41. (currently amended): The method of claim 26, wherein said genetic polymorphism is further defined as a restriction fragment length polymorphism, simple sequence length polymorphism, amplified fragment length polymorphism, single nucleotide polymorphism or isozyme.
42. (currently amended): The method of claim 26, wherein said genetic polymorphism is associated with increased carcass weight.
43. (canceled)
44. (currently amended): The method of claim 26, wherein said genetic polymorphism is associated with increased weaning weight.
45. (canceled)
46. (original): The method of claim 26, wherein said first parent head of beef cattle is the sire and said second parent head of beef cattle is the dam.
47. (original): The method of claim 26, wherein said first parent head of beef cattle is the dam and said second parent head of beef cattle is the sire.

48. (original): The method of claim 26, further defined as comprising crossing said progeny head of beef cattle with a third head of beef cattle to produce a second generation progeny head of beef cattle.

49. (original): The method of claim 26, further defined as comprising repeating step (a) and step (b) from about 2 to about 10 times.

50. (currently amended): The method of claim 49, wherein said first parent head of beef cattle is selected from a progeny head of beef cattle resulting from a previous repetition of said step (a) and said step (b) and wherein said second parent head of beef cattle is from a selected cattle breed into which one wishes to introduce said genetic predisposition for increased ~~or decreased~~ carcass or weaning weight.

## REQUEST FOR RECONSIDERATION UNDER 37 C.F.R. §1.111

### A. Status of the Claims

Claims 26-50 were the subject of the instant Action. Claims 26-27, 29-30, 41-42, 45 and 50 were amended herein and claims 1-25, 43 and 45 were canceled without prejudice or disclaimer. Applicants reserve the right to later prosecute any cancelled subject matter. Claims 26-42, 44 and 46-50 are now pending in the case and are presented for reconsideration.

### B. Rejection of Claims Under 35 U.S.C. §112, Second Paragraph

The Action rejects claims 26-50 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out the subject matter which Applicant regards as the invention.

(1) The Action rejects claim 26 for use of the term "genetic polymorphism genetically linked to" as being indefinite. Applicants respectfully traverse.

The cited term is defined in the specification on page 9, lines 14-21, as follows:

By "linked" or "genetically linked" it is meant that a marker locus and a second locus are sufficiently close on a chromosome that they will be inherited together in more than 50% of meioses, e.g., not randomly. Thus, the percent of recombination observed between the loci per generation (centimorgans (cM)), will be less than 50. In particular embodiments of the invention, genetically linked loci may be 45, 35, 25, 15, 10, 5, 4, 3, 2, or 1 or less cM apart on a chromosome. Preferably, the markers are less than 5 cM apart and most preferably about 0 cM apart.

In view of the definition, the cited term is fully defined by the specification and the use of the term in the claims is not indefinite. Removal of the rejection under 35 U.S.C. §112, second paragraph, is thus respectfully requested.

(2) The Action rejects claim 27 for recitation of "said genetic polymorphism" and "said polymorphism" as being inconsistent and thus indefinite. In response, it is noted that the

claims have been amended to clarify the antecedent basis for "genetic polymorphism." It is believed that the rejection is now moot in light of the amendments. The amendments do not narrow the claims and, accordingly, Applicants do not intend to disclaim any subject matter by the amendments.

(3) The Action rejects claim 34 as being vague for reciting "between about 16 and about 20 copies." Applicants respectfully traverse on the basis that the cited term is sufficiently definite as one of skill in the art can readily ascertain the metes and bounds of the claim. This is demonstrated by prior caselaw. For example, in *Ex parte Eastwood*, 163 USPQ 316 (Bd. App. 1968), the term "about" used to define the area of the lower end of a mold as between 25 to about 45% of the mold entrance was held to be clear, but flexible. Similarly, in *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540 (Fed. Cir. 1983), the court held that a limitation defining the stretch rate of a plastic as "exceeding about 10% per second" is definite because infringement could clearly be assessed through the use of a stopwatch. Here, nothing in the claims suggests that the term "about" as it is used is any less clear than the prior definite uses. Removal of the rejection is thus respectfully requested.

(4) The Action rejects claim 49 as vague for the recitation of "between about 2 and about 10 times." Applicants respectfully traverse and again note that the use of "about" is sufficiently definite in accordance with prior caselaw as described immediately above. Removal of the rejection is thus respectfully requested.

### **C. Rejections Under 35 U.S.C. §103(a)**

The Action rejects claims 26-50 under 35 U.S.C. §103(a) as being obvious over Liu *et al.* (*Domestic Animal Endocrinology* 17:421-437, 1999) in view of Aggrey *et al.* (*The Journal of*

*Heredity*, 90:148-151, 1999); Schmutz *et al.* (*Mammalian Genome*, 6:710-713, 1995) and Heap *et al.*, (*The Journal of Animal Science*, 73:1529-1530, 1995). In particular, it is stated that Liu *et al.* teaches that liver-specific expression of growth hormone receptor 1A is responsible for Laron dwarfism in miniature *Bos indicus* cattle; that Aggrey teaches a PCR-based selection method for breeding milk-associated traits; that Schmutz also teaches DNA marker-assisted selection in animal breeding and that, in light of the foregoing, it would have been obvious for one of skill in the art to combine these teachings to arrive at the invention.

Applicants respectfully traverse on the basis that the cited references do not teach or suggest the claimed invention. Liu *et al.* concerns mutations causing dwarfism in miniature *Bos indicus* cattle. The mutation is associated with decreased cattle size, such as carcass size, but not with any increases in carcass or weaning weight. In contrast, the instantly claimed invention is directed to a method of breeding beef cattle leading to an increase in the probability of obtaining a progeny head of beef cattle with a predisposition for increased carcass or weaning weight. Liu *et al.* does not teach that the mutation has any association with increased carcass or weaning weight. Specifically, no teaching or suggestion has been made to show that a genetic polymorphism genetically linked to promoter P1 of exon 1A of the bovine growth hormone receptor gene could be used in order to increase carcass or weaning weight.

The teaching of Liu *et al.* goes to the cause of dwarfism in cattle, but at best suggests that lack of the Laron dwarfism mutation would yield cattle of normal size, not increased carcass or weaning weight. Absent such teaching, one of skill in the art would be without any motivation or expectation of success in breeding for increased carcass or weaning weight using a polymorphism genetically linked to promoter P1 of exon 1A of the bovine growth hormone receptor gene. Indeed, no showing is made that such a polymorphism for increased carcass or

weaning weight existed, let alone the motivation or knowledge to use the polymorphism in the claimed method for breeding beef cattle.

The other references cited do not cure the shortcomings of Liu *et al* in that they are silent as to polymorphisms associated with increased carcass and/or weaning weight. Aggrey *et al.* refers to milk traits, not increased carcass or weaning weight in beef cattle, and Schmutz is cited only with regard to marker-assisted breeding for the polled condition. No discussion of the teaching of Heap is provided, but Applicants note that this reference fails to discuss any phenotype associated with genetic markers and, particularly, increased carcass or weaning weight.

In conclusion, none of the cited references teach or suggest that polymorphisms genetically linked to promoter P1 of exon 1A of the bovine growth hormone receptor gene could be used in the claimed method for breeding beef cattle. One of skill in the art was therefore without the motivation or expectation of success required under 35 U.S.C. §103(a) at the time the application was filed. Removal of the rejection is thus respectfully requested.

**D. Conclusion**

In light of the foregoing, Applicants submit that all claims are in condition for allowance, and an early indication to that effect is earnestly solicited. The examiner is invited to contact the undersigned (512)536-3085 with any questions, comments or suggestions relating to the referenced patent application.